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**From:** Ussery, Ian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9A38606954D042F2ADE15D3E837902B2-USSERY, IAN]  
**Sent:** 4/4/2022 1:01:17 PM  
**To:** Johnson, Ken-E [Johnson.Ken-E@epa.gov]  
**Subject:** RE: EPA surface injection pressure formula

Thank you, Ken.

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**From:** Johnson, Ken-E <Johnson.Ken-E@epa.gov>  
**Sent:** Sunday, April 3, 2022 9:39 PM  
**To:** Ussery, Ian <Ussery.Ian@epa.gov>  
**Cc:** Friesenhahn, Brody <friesenhahn.brody@epa.gov>; Yun, Samuel <Yun.Samuel@epa.gov>; Bierschenk, Arnold <bierschenk.arnold@epa.gov>  
**Subject:** RE: EPA surface injection pressure formula

40 CFR 146.87 requires Class VI owners or operators to determine or calculate the fracture pressure of both the confining and injection zones.

R6 UIC does not have a specific formula for determining maximum surface pressure within the Class VI program. Within the Class I and II UIC programs, fracture pressure has been calculated or measured using a variety of different correlations (Eaton, Hubert-Willis, assumed formation fracture gradient, etc.) or measured with direct formation hydraulic tests such as step rate, in-situ stress testing, or mini-fracs. State UIC programs may also employ a variety of approaches although step rate testing remains a fairly common testing method.

In the Class VI site characterization guidance document (<https://www.epa.gov/sites/default/files/2015-07/documents/epa816r13004.pdf>), Section 4.4 – Fracture Pressure of the Injection and Confining Zones, EPA references step rate testing and encourages the use of subsurface gauges to conduct the test for depths greater than 3000 feet.

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**From:** Ussery, Ian <Ussery.Ian@epa.gov>  
**Sent:** Wednesday, March 30, 2022 11:00 AM  
**To:** Johnson, Ken-E <Johnson.Ken-E@epa.gov>  
**Cc:** Friesenhahn, Brody <friesenhahn.brody@epa.gov>; Yun, Samuel <Yun.Samuel@epa.gov>; Bierschenk, Arnold <bierschenk.arnold@epa.gov>  
**Subject:** FW: EPA surface injection pressure formula

Is this an answer we can provide?

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**From:** Nick Jones <njones@capturepointsolutions.com>  
**Sent:** Wednesday, March 30, 2022 10:57 AM  
**To:** Ussery, Ian <Ussery.Ian@epa.gov>  
**Cc:** Jeff Marcel <jmarcel@capturepointllc.com>  
**Subject:** EPA surface injection pressure formula

Hi Ian, quick question. What is EPA's formula for calculating maximum allowable surface injection pressure? If you could provide any references that will be much appreciated.

Many thanks

-Nick

**Nick Jones – PG**

Geologist

**CapturePoint Solutions**

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Ex. 6 Personal Privacy (PP)

